D. Pumping Stations

Materials used in the construction of wastewater pumping stations shall meet all applicable requirements specified in this standard and specification. Any materials or equipment proposed for pumping stations shall be as specified by the designer and approved for use by the Engineer. The designer shall submit to the Engineer all documentation necessary for the evaluation and subsequent approval or rejection of the non-specified materials or equipment.

E. Vacuum Sewerage Collection Systems

1. Vacuum sewer mains and crossovers

Pipe sizes four inches and larger shall be SDR-21, PVC, rubber ring joint and shall be in accordance with ASTM D 2241. Three inch size pipe shall be all solvent weld joint and shall be either Schedule 40, PVC, in accordance with ASTM D 1785 or SDR-21, PVC, in accordance with ASTM D 2241.

All pipe fittings shall be PVC, Schedule 40 with solvent weld joints. The fittings shall be produced by Spears Manufacturing Company or an approved equal from a PVC compound having a cell classification of 12454 conforming to ASTM D 1784. All PVC fittings, with the exception of wye fittings, shall be injection molded and shall be in accordance with ASTM D 2466. Wye fittings may be fabricated on the condition that the fitting dimensions do not deviate significantly from standard fitting dimensions. If wye fittings are fabricated, the fitting sockets shall be made in accordance with ASTM D 2466.

A written certification is required for all pipe, fittings and gaskets from the manufacturer stating that: (1) the product is suitable for continuous contact with domestic sewage; (2) the product is suitable for operation in a vacuum of 24 inches mercury; and (3) that the product has been tested with air at a minimum of 24 inches of mercury vacuum with a leak rate not exceeding one percent per hour for a four hour test.

2. Interface Valves, Breathers, and Controller/Sensor

Vacuum interface valves, breathers, and controllers shall be as manufactured and supplied by AIRVAC of Rochester, Indiana. The vacuum sewage valve shall be vacuum operated on opening and spring assisted on closing. The plunger and its shaft shall be arranged to be completely out of the flow path when the valve is in its open position. The valve shall be equipped with a vacuum operator of the rolling diaphragm type and of sufficient diameter to overcome all sealing forces and open the valve fully using line vacuum pressure from the downstream side of the valve. All materials of the valve shall be chemically resistant to sewage.

The valve shall be equipped with a controller/sensor which shall rely on atmospheric air and vacuum pressure from the downstream side of the valve for its operation, thereby requiring no other power source. The controller/sensor shall be capable of maintaining the valve fully open for a fixed period of time (adjustable from 3 to 10 seconds). After the time period has elapsed, the controller/sensor shall be capable of admitting atmospheric air to the activator chamber and permitting spring assisted closing of the valve *All* materials shall be chemically resistant to sewage and sewage gases and shall be capable of operating when submerged in water and/or mud.

The in-sump breather shall be as manufactured by AIRVAC.

3. Valve Pits

Valve pits shall be as manufactured and supplied by AIRVAC of Rochester, Indiana. The fiberglass pits shall be 3'-0" inside diameter at the bottoms and be conical shaped to allow fitting of a 23-1/2" diameter clear opening cast iron frame and cover. Standard valve pit depth shall be 3'-6" and Pits shall be suitable for AASHTO Highway Loading Class H-2O . Each valve pit shall be supplied with an anti-flotation collar. Anti-flotation collars shall be either as supplied by the valve pit manufacturer or shall be constructed of concrete in accordance with the valve pit manufacturer's recommendations.

Frame and cover shall be designed for H-20 traffic loading. Frame shall weigh no less than 90 pounds and cover no less than 100 pounds. Lids shall be Model R 5900 F by Neenah Foundry or approved equal. The lids shall not be painted and shall be non-locking.

4. Collection Sumps

Collection sumps shall be as manufactured and supplied by AIRVAC of Rochester, Indiana. The sumps shall be made using a liquid polymer resin molding injection process, and shall be designed for H-20 loading at two feet depth of cover. Elastomer connections shall be provided for connecting the gravity line(s).

Sumps shall be either "Standard" or "Deep" and shall be either 30 inches deep or 54 inches deep, respectively, and have a capacity of 55 gallons or 100 gallons, respectively.

5. Division Valves

Valves shall be the resilient wedge gate type suitable for continuous contact with domestic sewage under both vacuum and/or pressure. Valves shall be constructed and rated for 200 psig working pressure. Wedge shall be constructed of ductile